

Math 557 Sep 26

Midterm 1 Review

! Take-home Problem

Prove unique readability for the set of \mathcal{L} -formulas.

! Take-home Problem

Let \mathcal{L} be any finite language and let \mathcal{M} be a finite \mathcal{L} -structure. Show that there is an \mathcal{L} -sentence φ such that

$$\mathcal{N} \models \varphi \iff \mathcal{N} \cong \mathcal{M}.$$

! Take-home Problem

Give an example of a language \mathcal{L} and an \mathcal{L} -sentence ψ such that

- there is at least one \mathcal{L} -structure A such that $A \models \psi$,
- for all \mathcal{L} -structures A , if $A \models \psi$, then the universe A of A is infinite.

! Take-home problem

Show that

$$\begin{aligned} \{\varphi \rightarrow \psi\} &\vdash \exists x \varphi \rightarrow \exists x \psi \\ \{\varphi \rightarrow \psi\} &\vdash \forall x \varphi \rightarrow \forall x \psi \end{aligned}$$

! Take-home Problem

Show that for every \mathcal{L} -formula φ ,

$$T_H \vdash_{\mathcal{L}_H} \varphi \iff T \vdash_{\mathcal{L}} \varphi$$

! Take-home Problem

Use the compactness theorem to show (without using the Axiom of Choice) that every set can be linearly ordered.

Try to strengthen this to:

Every partial order can be extended to a linear order.